- 12. (New) The process as claimed in claim 11, wherein the impure (R)- and (S)-α-hydroxycarboxylic acids are prepared by acidic hydrolysis of the (R)- and (S)-cyanohydrins obtained by enzyme-catalyzed addition of a cyanide group donor to the corresponding optionally substituted aliphatic, aromatic or heteroaromatic aldehydes or ketones.
- 13. (New) The process as claimed in claim 11, wherein impure, aromatic (R)- and (S)-α-hydroxycarboxylic acids of the formula Ar-(CH₂)_nCH(OH)CO₂H in which n is 0 or an integer from 1 to 5 and Ar is an aryl or heteroaryl radical which is unsubstituted or mono- or polysubstituted by OH, C₁-C₄-alkyl or -alkoxy, thioalkyl, halogen, optionally substituted phenyl or phenoxy, amino or nitro, are employed.
- 14. (New) The process as claimed in claim 11, wherein (R)-2-chloromandelic acid is employed.
- 15. (New) The process as claimed in claim 11, wherein the α-hydroxycarboxylic acid to be purified is dissolved in the appropriate solvent with warming, then the solution is slowly cooled to 15 50°C and, after a standing time of five minutes to 20 hours, the crystallized product is filtered off, and the crystallizate is washed with the same solvent and dried.
- 16. (New) A process for the preparation of chemically and optically highly pure (R)- and (S)- α -hydroxycarboxylic acids, which comprises treating the hydrolysis solution obtained by acidic hydrolysis of the (R)- and (S)-cyanohydrins, prepared by enzyme-catalyzed addition of a cyanide group donor to the corresponding aldehydes or ketones, directly with an aromatic hydrocarbon, optionally in combination with a cosolvent, then extracting the mixture at hydrolysis temperature, whereupon after cooling of the organic phase the corresponding chemically and optically highly pure (R)- and (S)- α -hydroxycarboxylic acids having an optical purity of over 98%ee crystallize out.

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- 17. (New) The process as claimed in claim 16, wherein chemically and optically highly pure aromatic (R)- and (S)- α -hydroxycarboxylic acids of the formula Ar- (CH₂)_nCH(OH)CO₂H in which n is 0 or an integer from 1 to 5 and Ar is an aryl or heteroaryl radical which is unsubstituted or substituted by OH, C₁-C₄-alkyl or alkoxy, thioalkyl, halogen, optionally substituted phenyl or phenoxy, amino or nitro, are prepared.
- 18. (New) The process as claimed in claim 11 or 16, wherein toluene, xylene, benzene, ethylbenzene, isopropylbenzene or chlorobenzenes are employed as aromatic hydrocarbons.
- 19. (New) The process as claimed in claim 11 or 16, wherein the cosolvent employed is a solvent which increases the solubility of the hydroxycarboxylic acid in the organic phase and which is separable by distillation, in an amount from 5 to 50% by volume.